DETAILED ACTION

1. Applicant's amendment to the claims filed on 02/25/2010 has been considered and entered for the record.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The amendment to the specification (abstract) filed on 02/25/2010 has **not** been considered and entered for the record because markings showing the corrections to the abstract deleting the legal phraseology has not been included with the amended Abstract. See also MPEP 714.

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because of the inclusion of legal phraseology such as "means" on lines 5 and 8 of the Abstract. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 3-5 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Arnowitz et al. (US 2004/0033166 A1) in view of Gaillon et al (WO 99/27349) (with US 6,723,554 B1 being the closest English language translation) (previously cited). It is to be noted that in the previous office action, claim 3 was clearly rejected as it was rejected in the body of the rejection and although not included in the 103 statement, this was a minor insight.

10. Arnowitz discloses a automated robotic device for dynamically controlled crystallization of proteins that includes for claim 1 a chassis (chassis 300) or platform with multiple sample chambers (chambers 314) for containing proteins ([0122]). The chambers are monitored by camera (camera 310) which is an "optical system" and is fully capable of monitoring an "optical property" of each chamber ([0122]). This camera is connected to a guide rail and drives assembly (assembly 312; [0122]) that moves the camera from one sample chamber and the next and is fully capable of allowing "real time measurement" of the sample and is fully capable of measuring turbidity. Further, Arnowitz discloses using alternative systems such as static laser light scattering and dynamic laser light scattering in place of the camera ([0031]). The applied reference further discloses measuring turbidity ([0230]) with the static laser light scattering sensor. While the reference does not explicitly disclose using the static laser light scattering sensor on the x-y table, it would have been obvious for one of ordinary skill in

the art to substitute one of the alternative sensors for the camera on the movable table with a reasonable expectation of optical sensing success.

11. With regards to the monitoring and processing means for receiving real time measurements, it is assumed that applicant is invoking 112 sixth paragraph with regards to this limitation. The structure disclosed by the applicant is a computer program used to monitor and process the information from the sensors. Arnowitz discloses a analysis system (system 54) that includes a computer program that receives signals from the sensors and sends signals to the control system (system 58) in order to adjust the amount of reactant sent to the sample chamber ([0107]). Therefore, the program of Arnowitz is the art equivalent structure of the program disclosed by the instant application.

12. With regards to the Peltier effect heating system, Arnowitz discloses one or more Peltier devices for heating the fluid within the chambers that is pumped from the reagent reservoir ([0100]). The temperature is adjusted based on signals sent from the analysis system (system 54) that are supplied to the pumps and temperature controllers of the experimental apparatus ([0105]). This is being interpreted as the heating elements being independent and programmable for each sample chamber.

13. However, Arnowitz differs from claim 1 in that the reaction vessel has a volume ranging from 2 mL to 500 mL where Arnowitz discloses a reaction vessel having a volume of 1 mL.

14. Gaillon discloses a method for measuring the optical properties of a sample by feedback control. For claim 1, Gaillon discloses a container that has a useful volume

between 10 ml and 60 ml which is used as a fermentor (col. 13 lines 2-4; col. 18 lines 16-19). By increasing the size of the vessel, this provides the advantage of increasing the amount of material that can be cultured by the device using the conventional fermentor of Gaillon. Therefore, it would have been obvious to one of ordinary skill in the art to employ the fermentor with the volume suggested by Gaillon within the device of Arnowitz in order to obtain the predictable result of fermenting and testing a sample. Finally, the exact size of the fermentor is a change in shape that does not patentable distinguish the claimed invention over the prior art since a device with the claimed dimensions would not perform differently from the prior art device. See also MPEP 2144.04 IV (A).

15. With regards to claim 3, Arnowitz does not discloses a second sensor, however, the use of a second sensor would allow measurements to be taken from more than one region of the sample container and would allow the sensor to account for the dispersion/settling of the sample. Therefore, it would be obvious to one of ordinary skill in the art to employ a second sensor within Arnowitz in order to obtain more readings from the sample container. See MPEP 2144.04 VI (B).

16. With regards to claim 4, the camera of Arnowitz measures or receives light (an electromagnetic radiation) as discussed above.

17. For claim 5, Arnowitz discloses using a stepper motor ([0135]) to move the camera.

18. Regarding claim 9, Arnowitz discloses the steps of optically measuring a cell culture where the temperature control is operated one or more Peltier devices for

heating the fluid within the chambers that is pumped from the reagent reservoir ([0100]). The temperature is adjusted based on signals sent from the analysis system (system 54) that are supplied to the pumps and temperature controllers of the experimental apparatus ([0105]). This is being interpreted as the heating elements being independent and programmable for each sample chamber. Arnowitz further discloses automatically controlling the process ([0147]) based on signals from an optical digital microscope ([0147]) based on signals within each sample chamber. The optical sensor is moved from chamber to chamber ([0125] measuring each chamber. Finally, the optical sensor (i.e. camera) is connected to a guide rail and drives assembly (assembly 312; [0122]) that moves the camera from one sample chamber and the next and is fully capable of allowing "real time measurement" of the sample and is fully capable of measuring turbidity. Further, Arnowitz discloses using alternative systems such as static laser light scattering and dynamic laser light scattering in place of the camera ([0031]). The applied reference further discloses measuring turbidity ([0230]) with the static laser light scattering sensor. While the reference does not explicitly disclose using the static laser light scattering sensor on the x-y table, it would have been obvious for one of ordinary skill in the art to substitute one of the alternative sensors for the camera on the movable table with a reasonable expectation of optical sensing success.

19. Arnowitz differs from claim 9 in that the size of the sample chamber is not between 2 mL and 500 mL.

20. For claim 9, Gaillon discloses using a container that has a useful volume between 10 ml and 60 ml which is used as a fermentor (col. 13 lines 2-4; col. 18 lines 16-19). Furthermore, adjusting the volume of the base device of Arnowitz with the volume of Gaillon would be within the skills of one of ordinary skill in the art based on throughput requirements for testing or the amount of sample to be fermented. Therefore, it would have been obvious to one of ordinary skill in the art to employ the method of using a fermentor with the volume suggested by Gaillon within the device of Arnowitz in order to obtain the predictable result of fermenting and testing a sample.

21. With regards to claim 10, Arnowitz discloses injecting a fluid into the sample chamber based on the signal sent from the optical system ([0105]; [0107]).

22. Regarding claims 11-15, the limitations of these claims do not provide any structural limitations that distinguishes the claimed invention over the prior art and therefore, Arnowitz is fully capable of being able to "optimize cell culture methods", "make the analysis of gene expression mechanisms" where "the genes are involved in cell adherence mechanisms" and the device is fully capable of being able to study physical and physiochemical mechanisms".

23. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arnowitz et al. (US 2004/0033166 A1)in view of Gaillon et al (WO 99/27349) (with US 6,723,554 B1 being the closest English language translation) (previously cited) as applied above and in further view of Bannerjee (US 6,307,630 B1) (previously cited).

24. Arnowitz is silent regarding a emitting or receiving diode. Gaillon discloses that the emitted light is received by a photo-darlington type photo-detector (col. 11 lines 49-50), but does not mention a receiving diode.

25. Bannerjee discloses a turbidimeter array system that uses a common light source and detector to obtain optical data from a plurality of test samples. For claim 2, Bannerjee discloses that the turbidity sensor includes a light source which is a light emitting diode and a detector which is a photodiode (col. 3 lines 58-64). Other solutions to receiving light from the sample also include a photomultiplier tube, an avalanche photodiode, a CCD, a mirror or optical fiber. Furthermore, Bannerjee demonstrates that a receiving diode was a known element at the time of the instant application. Therefore, it would have been obvious to one of ordinary skill in the art to employ the photodiode as suggested by Bannerjee within the optical unit of Arnowitz and Gaillon in order to obtain the predictable result of sending the light from the sample container to a sensor.

26. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arnowitz et al. (US 2004/0033166 A1)in view of Gaillon et al (WO 99/27349) (with US 6,723,554 B1 being the closest English language translation) (previously cited) as applied above and in further view of Bell et al. (US 5,814,277) .

27. Arnowitz and Gaillon are silent regarding a mobile sample injector.

28. Bell discloses an automatic multiple-sample, multiple-reagent chemical analyzer that includes a rotary plate that includes a reagent container, a sample container and a test cell where the temperatures of the containers are controlled by a heater and a

Peltier cooler. For claim 6, Bell uses an arm with a probe attached to the end of the arm to remove a specific amount of reagent and sample from each container and injects the reagent and sample into a test cell (col. 3 lines 53-65; col. 4 lines 9-11 & 21-23). The arm is being interpreted as being independent of the sensor based on Figure 2a. Therefore, it would have been obvious to one of ordinary skill in the art to employ the arm of Bell in order to load samples into the containers of Arnowitz and Gaillon. The suggestion for doing so at the time would have been in order to provide sufficient mixing of the samples within the test cell (col. 4 lines 27-28).

Response to Arguments

29. Applicant's arguments filed 02/25/2010 have been fully considered but they are not persuasive.

30. On page 6 through the middle of page 7, applicant summarizes the previous Office Action and the claimed invention.

31. On the bottom of page 7 through the top of page 8, applicant summarizes the applied reference of Arnowitz.

32. In the first full paragraph of page 8, applicant argues that Arnowitz fails to teach an optical sensor that is part of a mobile unit since the camera is attached to a microscope and does not move. Applicant further argues that the camera is the *sole* optical sensor and that the sensor is attached to each dialysis cell. The examiner disagrees with this characterization of the reference since applicant is arguing, primarily, the carousel embodiment and the x-y table was used in the rejection which includes a

mobile sensor. Further, it appears that applicant is also arguing that the claimed invention has two sensors on the mobile arm and the applied reference only has one. With regard to the independent claims, this is not found persuasive since this is a feature relied upon, but not claimed in either claim 1 or 9. It is also to be noted that claim 3 (multiple sensors) has been made obvious

33. Applicant further argues that the camera is not an external, mobile turbidity sensor. The examiner disagrees with this assertion since the camera is mounted on an external mover that has been interpreted as an external holder where both the moveable table and camera are external to the cells/micro-fermentors. In addition, the reference teaches measuring turbidity and the reference further teaches that these sensors, such as the static laser light scattering as discussed above, are alternatives to using the camera. Using one or the other would be a simple substitution for the skilled artisan based on the teachings of Arnowitz as was discussed above.

On page 8 through page 9, applicant traverses the applied reference of Gaillon which rendered obvious the size of the fermentor. In response to this rejection, applicant argues that the applied reference of Gaillon does not include technical information that would allow the skilled artisan to build the claimed robotic platform and does not include a mobile platform. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*,

642 F.2d 413, 208 USPQ 871 (CCPA 1981). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

34. Applicant argues on the bottom of page 9 that the combined references of Arnowitz, Gaillon and Bannerjee or Bell do not overcome the deficiencies within the references of Arnowitz and Gaillon. This is not found persuasive for the reasons stated above.

35. Regarding the objection to the specification, applicant's amendment overcomes the objection to the specification as was discussed above.

36. Therefore, the rejections are proper and will stand.

Conclusion

37. No claims are allowed.

38. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL HOBBS whose telephone number is (571)270-3724. The examiner can normally be reached on Monday-Thursday 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571) 272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. H./
Examiner, Art Unit 1797

/Michael A Marcheschi/
Supervisory Patent Examiner, Art Unit 1797